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# (54) Sliding door

(57) Sliding door (2) for closing an opening in a wall is provided with suspension and guiding means comprising a roller assembly comprising some pairs (4) of rollers (5,6) which are independently rotatably supported by a horizontal shaft (7), said rollers being connected to the upper edge of the door (2) and being supported by a suspension rail (8) substantially consisting of two bearing surfaces (9,10) slanting mainly obliquely downwardly from the middle of the rail, said rail (8) being mounted above the opening in the wall and being provided with local recesses (11) being shaped such that the door when reaching its closed position is moving somewhat downwardly and towards the wall.

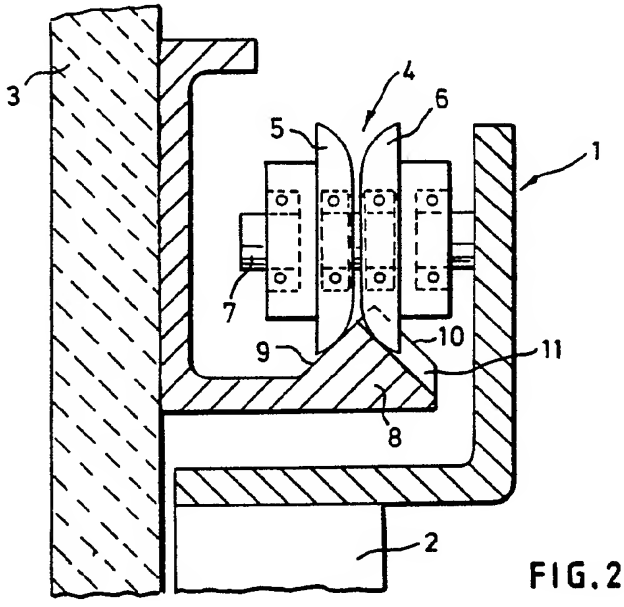


FIG.2.

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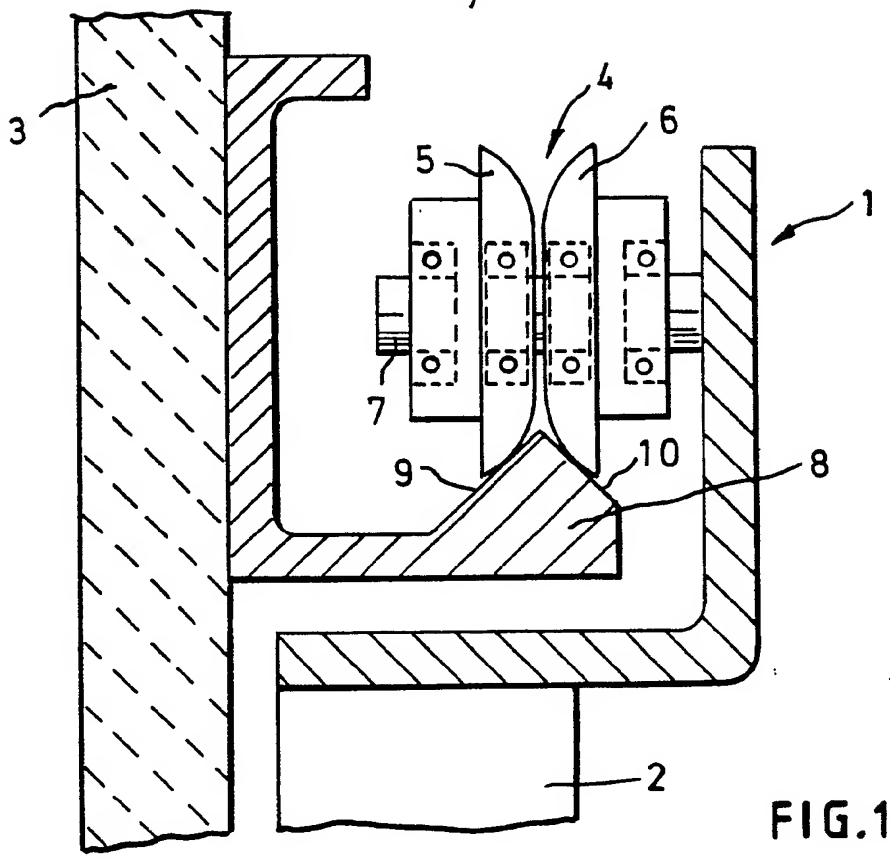


FIG.1.

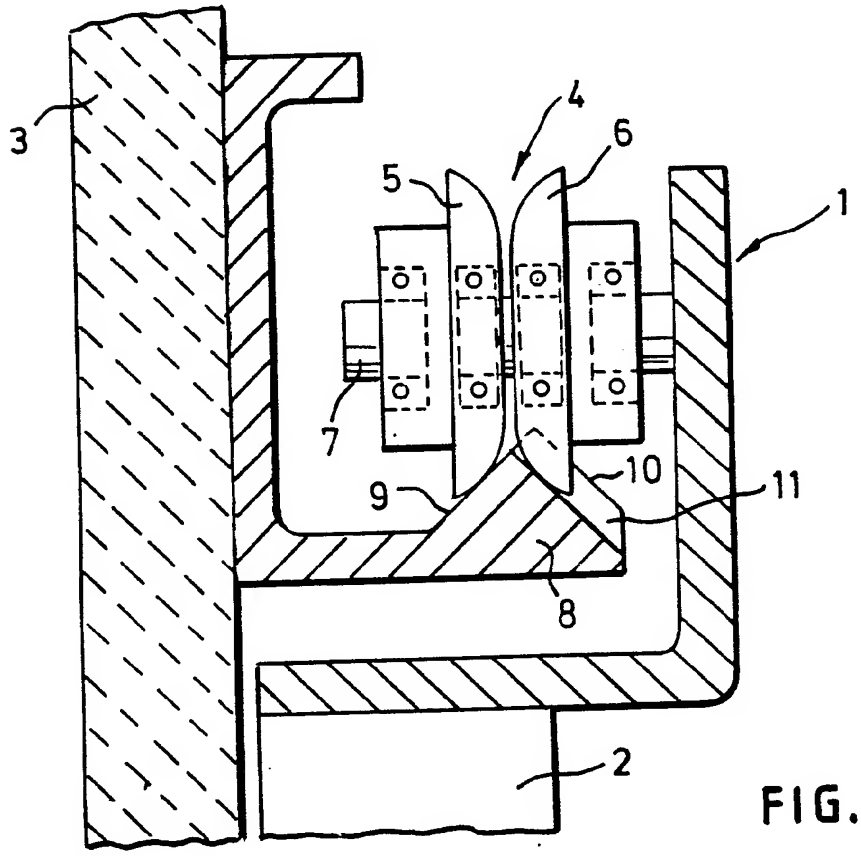


FIG.2.

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# SLIDING DOOR

The invention relates to a sliding door for closing an opening in a wall, being provided with suspension and guiding means comprising a roller assembly connected to the upper edge of the door by which the door is movable along a suspension rail at a distance from and parallel to the wall, said rail being mounted above the opening in the wall and being provided with local recesses being shaped such that the door when reaching its closed position is moving somewhat downwardly and towards the wall.

Such a sliding door is known from the U.S. patent 4,404,770. Such sliding doors, for example, are used as hermetically sealing doors in cold- and frozen-storage warehouses or in hospitals or as fire resisting or sound absorbing doors.

The known sliding door is suspended from a number of rollers running in a V-shaped groove of a guiding rail. In praxis it has appeared that dirt and dust, e.g. building dirt, may accumulate in this groove as a result of which moving the door will be difficult. Also in view of applying said doors in cold-storage warehouses

or hospitals this accumulation of dirt can be undesirable from hygienic considerations.

The object of the invention is to provide a sliding door with a suspension and guiding construction which does not permit the precipitation of dirt on the bearing surfaces of the guiding rail.

According to the invention the guiding rail substantially consists of two bearing surfaces slanting mainly obliquely downwardly from the middle of the rail and each cooperating with separate rollers which are independently rotatably supported by a horizontal shaft.

In this way dirt and dust which might be present on the bearing surfaces of the rail automatically falls downward along the downwardly slanting surfaces so that the sliding door will maintain its easy running property, even after long periods or in dirty surroundings. When the door approaches its closed position, and the outer roller is moving downwardly in a local recess or notch in the rail and the inner roller is sliding downwardly along the slanting bearing surface in the direction of the wall, a velocity difference between both roller arises. According to a further feature of the invention, because these rollers are independently rotatably supported during closing and

opening the sliding door, a minimal resistance and wear of the construction will be guaranteed.

According to the invention it is preferred that both bearing surface are each slanting downwardly from the middle of the rail at an angle of about 45° with the horizontal plane.

According to another embodiment of the invention it is also possible that the suspension rail consists of a shaft or tube with a circular cross section. In this way rail profiles are obtained which have bending strength, are simple to produce and are unaffected by dirt and dust.

According to a further feature of the invention a very simple and compact construction is obtained when the roller assembly consists of some pairs of rollers, both rollers of each pair of rollers being rotatably supported by one common horizontal shaft.

Now the invention will be further described by way of example and with reference to the accompanying drawings, in which an embodiment of the sliding door according to the invention is shown and wherein:-

Fig 1 schematically shows a side view of a sliding door in the open position.

Fig. 2 schematically shows a side view of the sliding door shown in figure 1 in the closed position.

Fig. 1 shows a sliding door 1 with a door panel 2 for closing an opening (not shown) in the wall 3. Near an upper edge, the sliding door 1 is suspended at some distance from the wall 3 by a roller assembly consisting of some pairs 4 of rollers, each pair comprising an inner roller 5 and an outer roller 6 which are independently rotatably supported by a common horizontal shaft 7. The suspension rail 8 is provided with two bearing surfaces 9 and 10 slanting downwardly from the middle of the rail at an angel of 45° with the horizontal plane and cooperating with the rollers 5 and 6 respectively of the pairs 4 of rollers.

When the door is reaching its closed position shown in Fig. 2, the outer rollers 6 are descending in local recesses or notches 11 in the outer bearing surface 10 of the rail and the inner rollers 5 are sliding somewhat downwardly along the slanting bearing surface 9, so that the door panel 2 is moving somewhat downwardly and towards the wall. In its closed position the door panel 2 may engage flexible sealing means (not shown) for example, in the wall and in the floor to obtain a hermetical sealing.

Obviously the invention is not limited to the embodiment described above but modifications can be made in several ways without departing from the inventive concept. For example, the suspension rail 8 may consist of a shaft or a tube with a circular cross section. Instead of being mounted on a common horizontal shaft the rollers 5 and 6 of the pair of rollers may be positioned to be staggered in respect of each other, each being rotatably supported on a separate horizontal shaft. All these possibilities, however, will be obvious to a person skilled in the art and need no further description.

## CLAIMS

1. A sliding door for closing an opening in a wall and being provided with suspension and guiding means comprising a roller assembly connected to the upper edge of the door by which the door is movable along a suspension rail at a distance from and parallel to the wall, said rail being mounted above the opening in the wall and being provided with local recesses being shaped such that the door, when reaching its closed position, is moving somewhat downwardly and towards the wall, characterised in that the rail comprises two bearing surfaces slanting mainly obliquely downwardly from the middle of the rail and each cooperating with separate rollers which are independently rotatably supported by a horizontal shaft.

2. A sliding door according to claim 1, characterized in that both bearing surfaces each slant downwardly from the middle of the rail at an angle of about 45° with the horizontal plane.

3. A sliding door according to claim 1, characterized in that the suspension rail consists of a shaft or a tube with a circular cross section.

4. A sliding door according to any one of the preceding

claims, in which the roller assembly consists of some pairs of rollers, characterized in that both rollers of each pair of rollers are rotatably supported by one common horizontal shaft.

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